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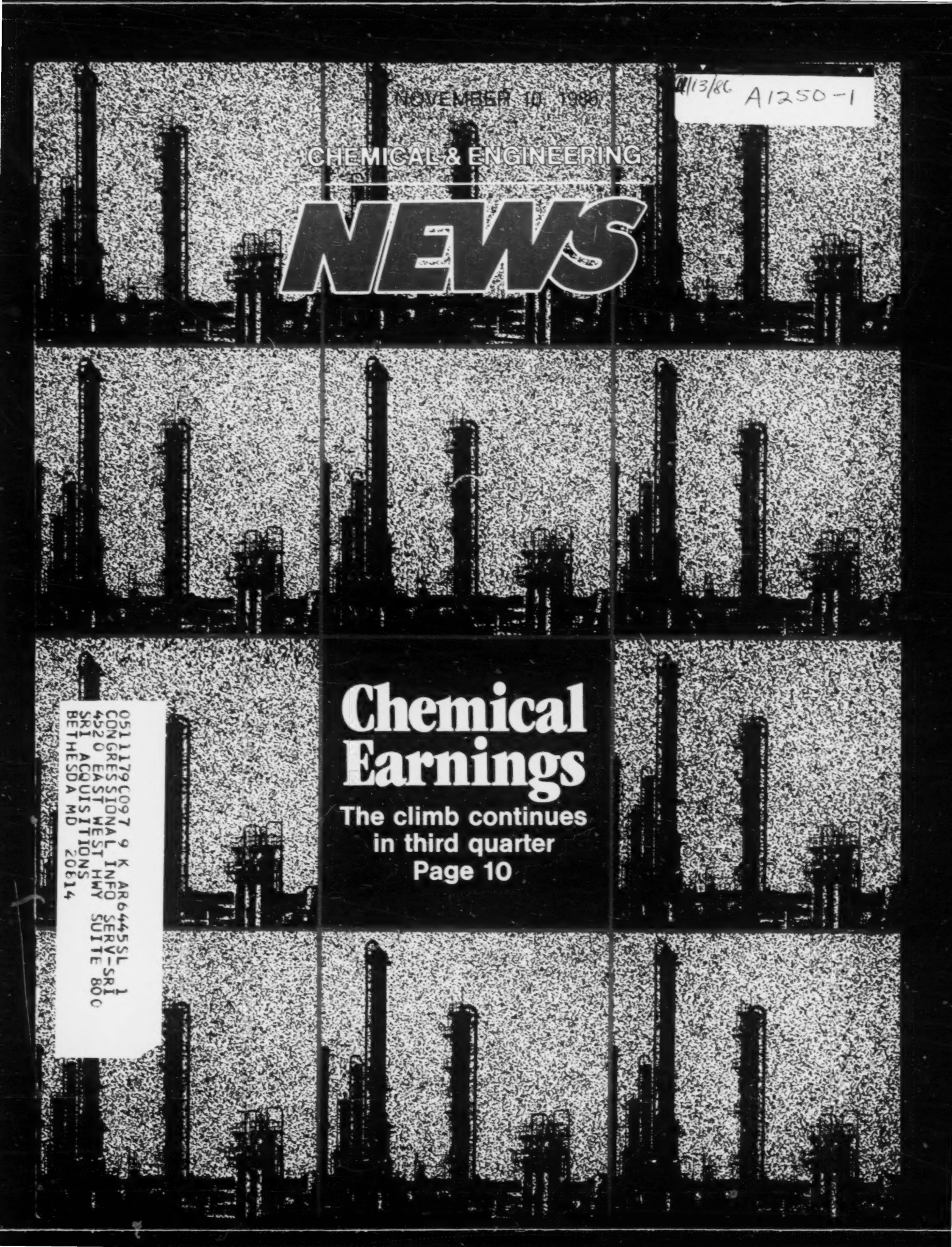
NOVEMBER 10, 1986

CHEMICAL & ENGINEERING

NEWS



Chemical Earnings

The climb continues in third quarter

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News of the Week

■ **Merger of West Germany's Hoechst with Celanese will create the world's largest chemical firm.** **Page 4**

■ **Gordon L. Nelson, chairman of the department of polymer science at the University of Southern Mississippi, has been elected ACS's 1987 president-elect.** **Page 5**

■ **Chemistry Day programs have been scheduled by several ACS local sections this fall, which will serve as trial runs for the 1987 National Chemistry Day.** **Page 6**

Government

Rep. Don Fuqua, retiring from the House, makes recommendations to improve the science infrastructure, based on two-year task force study on how science policy is set and how it works. **Page 16**

Science

Sigma Xi celebrates its centennial by focusing on expanding its international activities, developing science-and-society programs, and dealing with current problems of U.S. science. **Page 20**

Max Tishler, noted chemist and former ACS president, is feted by 300 friends, colleagues, and students on Wesleyan University's campus on the occasion of his 80th birthday. **Page 22**

ACS News

The society commends OSHA on several aspects of its proposed standards for laboratory workers, but says some requirements need to be strengthened. **Page 27**

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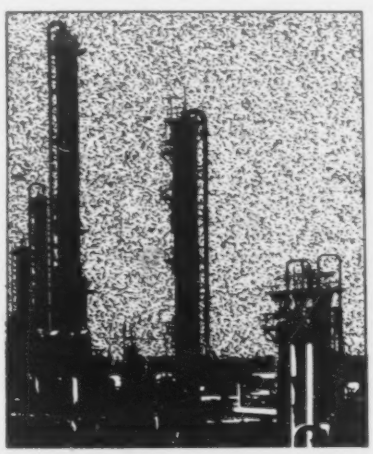


Business

Chemical earnings continue to climb in third quarter, as a result of ongoing streamlining of companies, falling value of dollar against foreign currencies, and lower oil and natural gas prices. **Page 10**

Chemical Earnings Continue To Climb in Third Quarter

William J. Storck, C&EN New York

Earnings for major chemical companies continued to increase in the third quarter, spurred once again by improved utilization of plant and personnel and increased production. Earnings at major diversified companies that produce chemicals also were up, but earnings at petroleum and natural gas-producing firms were down because of the drop in oil price and excess supplies.

For the July-to-September period, combined earnings for the 30 largest chemical companies, excluding any significant nonrecurring and extraordinary items, climbed 23% to about $757 million. Sales totaled $16.8 billion, essentially the same as in third-quarter 1985. As a result, profit margins (earnings as a percentage of sales) for the 30 companies rose to an average of 4.5% from an average of 3.7% in last year's third quarter.

The year-to-year comparison may not be so rosy as it seems, however, since last year's third quarter was a very poor one—the next to last quarter before the chemical industry began its earnings turnaround at the beginning of 1986. In fact, the third quarter's 4.5% profit margin for the 30 firms is less than in either this year's first quarter (4.8%) or second quarter (5.6%).

The major spur to increased earnings in three successive quarters of 1986 seems to be the streamlining that companies have been performing over the past few years. These

Chemical industry leaders for the third quarter . . .

Sales

Rank 1986		$ Millions	Rank 1985
1	Dow Chemical	$2787.0	1
2	Monsanto	1695.0	2
3	Union Carbide	1552.0	3
4	W. R. Grace	1321.2	4
5	PPG Industries	1140.0	5
6	American Cyanamid	921.4	6
7	Chesebrough-Pond's	733.4	9
8	Celanese	693.0	8
9	Hercules	638.7	10
10	B. F. Goodrich	574.1	7

Earnings[a]

	$ Millions	Rank 1985
Dow Chemical	$170.0	1
PPG Industries	82.5	2
Hercules	53.1	7
Celanese	50.0	3
Ethyl	46.8	5
American Cyanamid	44.8	9
Chesebrough-Pond's	40.4	12
Union Carbide	38.0	11
Rohm & Haas	37.3	6
Air Products	33.4	4

Profitability

	Earnings as % of sales	Rank 1985
International Flavors	13.7%	1
Ethyl	11.6	4
Loctite	8.6	6
Hercules	8.3	12
Nalco Chemical	8.1	3
Rohm & Haas	7.6	7
Lubrizol	7.6	11
PPG Industries	7.2	9
Celanese	7.2	10
Air Products	6.6	5

. . . and for the first nine months of 1986

Sales

Rank 1986		$ Millions	Rank 1985
1	Dow Chemical	$8543.0	1
2	Monsanto	5309.0	2
3	Union Carbide	4649.0	3
4	W. R. Grace	3982.2	4
5	PPG Industries	3490.0	5
6	American Cyanamid	2866.3	6
7	Chesebrough-Pond's	2341.0	10
8	Celanese	2183.0	9
9	B. F. Goodrich	2062.0	7
10	Hercules	1975.0	9

Earnings[a]

	$ Millions	Rank 1985
Dow Chemical	$572.0	1
Monsanto	278.0	3
PPG Industries	243.5	2
Hercules	176.3	8
Celanese	156.0	5
American Cyanamid	150.4	9
Union Carbide	133.0	4
Rohm & Haas	131.4	6
Chesebrough-Pond's	125.9	14
Ethyl	124.0	10

Profitability

	Earnings as % of sales	Rank 1985
International Flavors	14.5%	1
Ethyl	10.4	5
Freeport-McMoRan	10.1	2
Loctite	9.0	4
Hercules	8.9	12
Rohm & Haas	8.2	9
Nalco Chemical	7.9	3
Celanese	7.1	13
Lubrizol	7.0	10
Air Products	7.0	7
PPG Industries	7.0	8

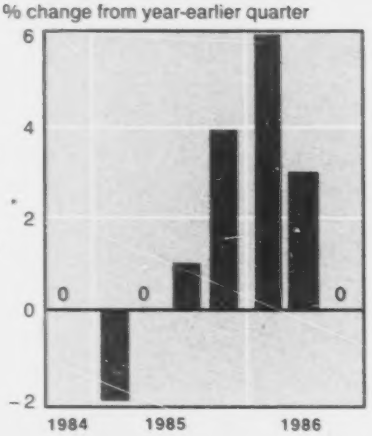
a After taxes. **Note:** For 30 chemical companies listed on page 12.

Chemical industry 1986 third-quarter results

- Sales were unchanged
- Earnings climbed 23%
- Profit margins fell to 4.5%
- Production rose 5.5%
- Prices declined almost 2%

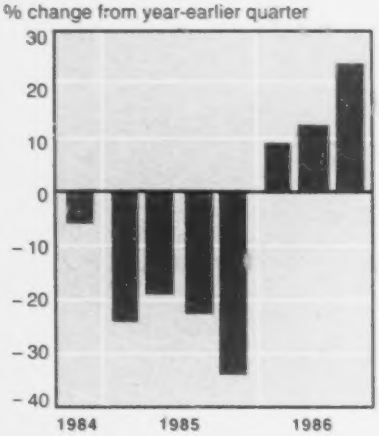
Sales

% change from year-earlier quarter



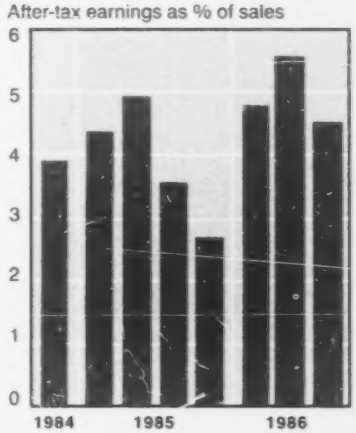
Earnings

% change from year-earlier quarter



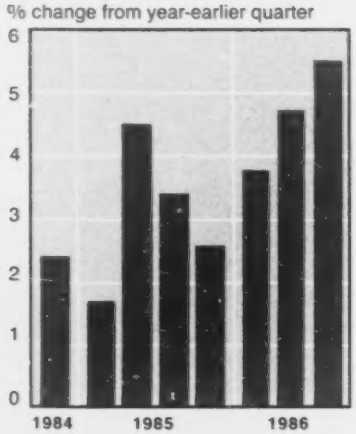
Profit margins

After-tax earnings as % of sales



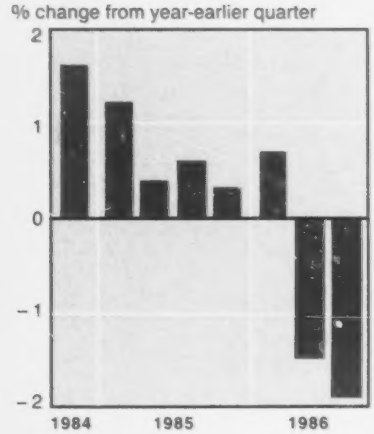
Production

% change from year-earlier quarter



Prices

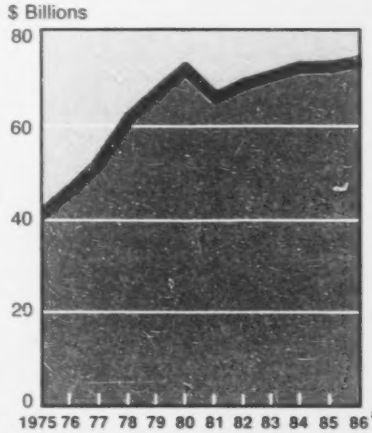
% change from year-earlier quarter



Sales in 1986 will be up slightly, and earnings will climb about 20%, increasing profit margins to about 5.3%

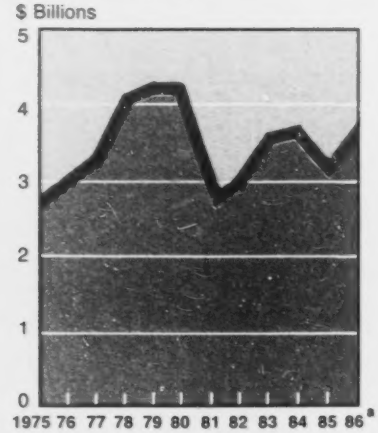
Annual sales

$ Billions



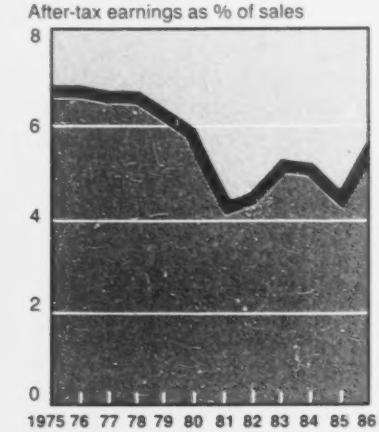
Annual earnings

$ Billions



Annual profit margins

After-tax earnings as % of sales



a C&EN estimates. **Note:** All sales, earnings, and profit-margin data are based on combined results of 30 companies listed on page 12.

Earnings, profit margins up substantially for most chemical firms in third quarter

	THIRD-QUARTER 1986						NINE-MONTHS 1986			
	Sales	Earnings[a]	Change from 1985		Profit margin[b]		Sales	Earnings[a]	Change from 1985	
	($ millions)		Sales	Earnings	1986	1985	($ millions)		Sales	Earnings
Air Products[c]	$ 502.5	$ 33.4	5%	−12%	6.6%	8.0%	$ 1,506.3	$ 105.2	8%	−6%
American Cyanamid[c]	921.4	44.8	8	52	4.9	3.5	2,866.3	150.4	8	44
Celanese[c]	693.0	50.0	−9	6	7.2	6.2	2,183.0	156.0	−5	22
Chemed	108.8	5.0	12	−4	4.6	5.4	306.5	15.5	10	−11
Chesebrough-Pond's[c]	733.4	40.4	5	104	5.5	2.8	2,341.0	125.9	25	135
Crompton & Knowles	59.3	1.9	5	8	3.2	3.1	186.0	6.4	7	23
Dow Chemical[c]	2,787.0	170.0	−3	59	6.1	3.7	8,543.0	572.0	−1	54
Essex Chemical	48.0	1.6	4	9	3.3	3.1	159.4	8.0	6	9
Ethyl[c]	404.9	46.8	5	33	11.6	9.1	1,188.9	124.0	2	25
First Mississippi	55.2	−0.1	−16	def	def	def	184.9	4.0	−11	−57
Freeport-McMoRan	132.1	7.6	−18	−58	5.7	11.0	458.1	46.1	−19	−27
H. B. Fuller	136.6	5.7	17	47	4.2	3.3	388.6	13.8	14	51
B. F. Goodrich[c]	574.1	13.7	−31	1613	2.4	0.1	2,062.0	0.2	−15	−99
W. R. Grace[c]	1,321.2	4.3	6	−84	0.3	2.2	3,982.2	4.7	5	−93
Hercules[c]	638.7	53.1	4	59	8.3	5.4	1,975.0	176.3	1	59
International Flavors	164.9	22.5	29	24	13.7	14.3	475.0	68.7	25	25
International Minerals	340.3	−6.7	55	def	def	0.0	1,190.9	−26.9	23	def
Loctite	70.7	6.1	16	29	8.6	7.8	211.5	19.0	21	13
Lubrizol	232.8	17.7	15	54	7.6	5.7	770.2	54.1	9	16
Monsanto[c]	1,695.0	13.0	−3	−58	0.8	1.8	5,309.0	278.0	6	15
Nalco Chemical	184.5	15.0	10	−12	8.1	10.1	547.0	43.0	10	−13
National Distillers[c]	541.6	10.1	−3	−44	1.9	3.2	1,703.9	42.3	4	−1
Olin[c]	407.5	7.0	−5	27	1.7	1.3	1,300.0	56.4	−4	80
Pennwalt	272.2	14.0	10	def	5.1	def	828.6	39.4	9	692
Petrolite	63.6	2.3	−14	−55	3.6	6.9	214.0	13.9	−6	−26
PPG Industries[c]	1,140.0	82.5	5	12	7.2	6.8	3,490.0	243.5	7	0
Reichhold Chemicals	178.5	2.5	−14	def	1.4	def	600.9	6.5	−4	56
Rohm & Haas[c]	488.5	37.3	3	7	7.6	7.3	1,598.3	131.4	1	13
Union Carbide[c]	1,552.0	38.0	2	46	2.4	1.7	4,649.0	133.0	0	−2
Witco	337.9	17.2	−8	8	5.1	4.4	1,028.9	48.7	−7	17
Total 15 largest companies[d]	**$14,400.8**	**$644.4**	**−1%**	**22%**	**4.5%**	**3.6%**	**$44,697.8**	**$2299.3**	**2%**	**20%**
Second 15 companies	**$ 2,385.6**	**$112.2**	**8%**	**28%**	**4.7%**	**3.9%**	**$ 7,550.7**	**$ 360.3**	**5%**	**−8%**
GRAND TOTAL[d]	**$16,786.4**	**$756.7**	**0%**	**23%**	**4.5%**	**3.7%**	**$52,248.5**	**$2659.6**	**3%**	**15%**

a Earnings from continuing operations, excluding significant nonrecurring and extraordinary items. b Earnings as a percentage of sales. c One of 15 largest companies. d Dow Chemical results are not included in 12-month running totals because of large pretax nonrecurring loss in the fourth quarter of 1985. **def** = deficit.

actions have served to lower effective breakeven points at most firms so that a slight increase in production causes a more than arithmetic increase in earnings and, therefore, margins. Also, companies are benefiting from an improved international situation. The falling value of the dollar against foreign currencies has helped increase exports for some companies, while serving to decrease competition in the U.S. from foreign goods, by increasing their effective price. The fall of the dollar has helped in many areas, but unfortunately not in Canada—the U.S.'s largest trading partner—nor in South Korea, where currencies also have fallen in value along with the dollar.

Other benefits have resulted from lower prices for oil and natural gas, which translates to lower raw material costs for production of petrochemicals, by far the largest segment of the U.S. chemical industry.

One area not contributing generally to the chemical industry's strong performance is product pricing. In the third quarter, prices for chemicals and allied products, according to Department of Labor statistics, declined almost 2% from third-quarter 1985. In the second quarter, prices were down 1.5% from a year earlier. Essentially two factors account for the price decline—overcapacity and pressure from customers because of the falling oil price. The chemical industry, according to government estimates, is still operating at about 80% of capacity, although plants for some products are operating at much higher rates than that. But operating rates in the 80% range still do not allow for much in the way of price increases. The pricing problem is exacerbated in petrochemicals by the declining oil price and customer demands that petrochemical suppliers make their

NINE-MONTHS 1986		12-MONTH RUNNING DATA			
Profit margin[b]		Change from 1985		Profit margin[b]	
1986	1985	Sales	Earnings	1986	1985
7.0%	8.0%	8%	−3%	7.0%	7.8%
5.2	3.9	2	19	5.0	4.3
7.1	5.6	−5	29	7.0	5.1
5.1	6.3	9	8	4.6	4.6
5.4	2.9	29	123	4.4	2.5
3.5	3.0	7	21	3.6	3.2
6.7	4.3	1	−41	2.3	3.9
5.0	4.9	6	−10	4.6	5.4
10.4	8.5	1	18	10.3	8.9
2.2	4.5	−5	−50	2.8	5.2
10.1	11.1	−22	−35	9.8	11.7
3.5	2.7	12	43	3.6	2.8
0.1	2.2	−12	−160	−0.3	0.4
0.1	1.8	−9	−60	0.8	1.9
8.9	5.7	2	26	7.3	5.8
14.5	14.5	24	23	13.9	14.0
def	4.3	14	−138	−1.5	4.6
9.0	9.7	19	10	8.9	9.6
7.0	6.6	8	7	6.8	6.9
5.2	4.8	8	−22	3.1	4.3
7.9	9.9	10	−11	8.6	10.6
2.5	2.6	6	9	2.5	2.4
4.3	2.3	−12	18	3.3	2.4
4.8	0.7	4	106	4.1	2.1
6.5	8.2	−3	−32	5.9	8.5
7.0	7.5	7	−4	6.6	7.3
1.1	0.7	−1	−143	−0.6	1.3
8.2	7.4	2	10	7.5	7.0
2.9	2.9	−13	−35	2.1	2.9
4.7	3.8	−7	14	4.6	3.8
5.1%	**4.4%**	**−1%**	**−1%**	**4.0%**	**4.0%**
4.8%	**5.5%**	**4%**	**−17%**	**4.6%**	**5.8%**
5.1%	**4.5%**	**0%**	**−4%**	**4.1%**	**4.3%**

Ground rules for C&EN earnings analysis

C&EN's quarterly report on financial performance of the U.S. chemical industry contains data from the 30 largest U.S. basic chemical companies and from 34 oil and diversified companies, each with more than $200 million in annual chemical sales.

To be included in the table of basic chemical producers, a company must have at least 40% of its sales in chemicals, and its chemical operations must be the largest single portion of the total operations. That is why Du Pont, for example, is included in the table of diversified manufacturers.

In referring to chemical sales, C&EN means those chemicals whose molecular composition has been changed in the course of manufacture. Hence, chemical sales include those of traditional categories of basic petrochemicals and inorganics, organic intermediates and inorganic compounds, polymers, agricultural chemicals, and specialty derivatives.

In listing earnings, the survey gives after-tax income for continuing operations before nonrecurring items and extraordinary charges. Foreign currency translations are included.

own prices reflect any breaks they get on raw material costs.

Production, however, is increasing. In the third quarter, output was about 5.5% higher than in third-quarter 1985, following a 4.7% year-to-year rise in the second quarter.

With a combination like that, chemical companies have to rely on the improved earnings leverage brought about by the cuts in personnel, the streamlining of plants, and the pruning of unprofitable or marginally profitable lines of business that have been taking place for the past few years.

As the third-quarter results attest, those moves are working. Earnings improvements in the quarter came from many segments of the chemical economy, with the exception of fertilizers. For Dow Chemical, executive vice president Robert M. Keil says: "All of Dow's business segments posted improved operating income over the comparable period of 1985, and we continued to operate our plants at high rates in our basic chemicals and basic plastics segments. Further tightening in supply and demand balances for basics is helping support the earnings capability of these businesses in this period of lower costs for some raw materials, particularly hydrocarbons."

At Du Pont, the country's largest chemical producer, chairman Richard E. Heckert says, "Results for the third quarter are encouraging. Most of our chemical and specialty products businesses posted strong results, reflecting our improved cost structure and strength overseas."

Even agricultural chemicals, with the exception of fertilizers, seemed to be improving in spite of the bad farm economy. George J. Sella Jr., chairman of American Cyanamid, remarks that worldwide sales of the company's agricultural chemicals group were about even in the third quarter with those of the previous year, despite the company's withdrawal from the diammonium phosphate business in June.

Rohm & Haas chairman Vincent L. Gregory Jr. says: "The agricultural business outside the U.S. was strong, and we continue to see market penetration and volume growth for new products." But he adds, "The depressed condition of the U.S. farm economy, combined with increased competition, led to lower sales of Blazer, our soybean herbicide."

Fertilizers, however, still are suffering. For instance, W. R. Grace & Co. says it had an $8.6 million loss in the third quarter on fertilizer operations. And First Mississippi says it had a $700,000 pretax loss on fertilizer, compared with a $300,000 loss on those operations in the same period last year.

In the third quarter, the industry returned to a long-term pattern of the smaller, more specialty-oriented firms outperforming the larger, more commodity-oriented firms. This trend had been suspended in the past few quarters as the smaller firms had been hit by higher costs and more limited market growth.

In this year's third quarter, the smaller 15 firms of the 30 firms surveyed posted a combined earnings gain of 28% to $112 million on a sales increase of 8% to $2.39 billion. The group's average profit margin for the quarter was 4.7%, compared with 3.9% in third-quarter 1985.

Earnings were down for most oil firms, but up for diversifieds

	% chemical sales	THIRD-QUARTER 1986 Sales ($ millions)	Earnings[a]	Change from 1985 Sales	Earnings	Profit margin[b] 1986	1985	NINE-MONTHS 1986 Sales ($ millions)	Earnings[a]	Change from 1985 Sales	Earnings	Profit margin[b] 1986	1985
OIL AND GAS COMPANIES													
American Petrofina	15%	$ 509.6	$ 5.7	−15%	−47%	1.1%	1.8%	$ 1,493.0	$ −29.6	−15%	def	def	1.7%
Ashland	18	1,700.0	45.0	−23	−2	2.6	2.1	5,300.0	164.0	−13	37	3.1	2.0
Atlantic Richfield	17	3,532.0	121.0	−36	−70	3.4	7.3	11,368.0	570.0	−33	−51	5.0	6.8
Chevron	6	6,000.0	208.0	−42	−15	3.5	2.4	21,700.0	801.0	−37	−15	3.7	2.7
Exxon	12	17,186.0	1075.0	−23	−11	6.3	5.4	57,410.0	4149.0	−16	10	7.2	5.5
Kerr-McGee	14	601.2	−10.8	−24	def	def	5.0	1,945.8	14.5	−20	−87	0.7	4.5
Mobil	5	11,180.0	332.0	−24	−15	3.0	2.7	37,233.0	1354.0	−15	21	3.6	2.5
Occidental Petroleum	10	3,717.2	39.1	10	−81	1.1	5.9	11,175.2	152.0	4	−64	1.4	3.9
Phillips Petroleum	15	2,190.0	−23.0	−44	def	def	3.0	7,640.0	120.0	−36	−66	1.6	2.9
Shell Oil	19	4,011.0	133.0	−22	−64	3.3	7.1	12,841.0	628.0	−14	−37	4.9	6.7
Standard Oil	4	2,239.0	52.0	−35	−85	2.3	10.1	7,750.0	428.0	−23	−60	5.5	10.7
Texaco	3	7,300.0	162.0	−35	−46	1.8	2.7	24,800.0	675.0	−29	−27	2.7	2.6
Unocal	11	1,914.0	21.8	−37	−68	1.1	2.2	6,296.9	126.6	−28	−66	2.0	4.2
Williams Cos.	24	425.0	−30.3	−23	def	def	def	1,728.4	−7.4	−26	def	def	0.9
DIVERSIFIED COMPANIES													
Allied-Signal	24	2,907.0	164.0	8	7	5.6	5.8%	8,759.0	536.0	3	5	6.1	5.6
Borden	33	1,270.0	65.9	6	28	5.2	4.3	3,650.0	154.5	5	17	4.2	3.8
Borg-Warner	28	881.5	53.2	8	0	6.0	6.5	2,710.4	153.6	10	33	5.7	4.7
Cabot	51	303.2	12.9	−13	37	4.3	2.7	953.5	43.7	−8	−1	4.6	4.3
Du Pont	45	6,393.0	322.0	−12	59	5.0	2.8	20,471.0	1182.0	−6	25	5.8	4.3
Eli Lilly	22	883.4	135.6	12	11	15.3	15.5	2,751.0	433.9	12	10	15.8	16.0
Emhart	15	472.6	18.8	12	3	4.0	4.3	1,510.1	56.6	17	20	3.7	3.6
Engelhard	26	568.3	12.1	7	28	2.1	1.8	1,587.4	39.0	0	24	2.5	2.0
FMC	50	664.9	26.8	−13	−55	4.0	7.7	2,224.6	101.7	−7	−35	4.6	6.5
GAF	46	197.2	24.5	2	57	12.4	8.0	571.5	61.6	2	46	10.8	7.6
General Electric	8	9,280.0	604.0	42	5	6.5	8.8	22,940.0	1762.0	17	5	7.7	8.6
Kaiser Aluminum	13	592.0	−2.2	12	def	def	def	1,676.9	−24.6	11	def	def	def
Koppers	44	438.8	30.6	7	4	7.0	7.2	1,066.7	47.8	2	962	4.5	0.4
Merck	13	1,053.7	173.0	23	27	16.4	15.9	2,979.8	503.9	15	24	16.9	15.7
3M	15	2,236.0	215.0	11	24	9.6	8.6	6,490.0	594.0	10	15	9.2	8.8
Morton Thiokol	38	449.3	33.1	−2	−5	7.4	7.5	1,454.3	99.2	3	5	6.8	6.7
Pfizer	10	1,163.1	176.6	15	14	15.2	15.4	3,313.1	501.6	12	14	15.1	14.8
Tyler	41	245.9	3.9	5	−34	1.6	2.5	724.4	11.8	4	−19	1.6	2.1
USX	6	3,300.0	−183.0	−38	def	def	2.7	12,168.0	−426.0	−23	def	def	2.6
Vulcan Materials	25	263.7	35.7	−3	14	13.5	11.5	720.8	74.3	−2	14	10.3	8.9

a From continuing operations excluding significant nonrecurring and extraordinary items. b Earnings as a percentage of sales. **def** = deficit.

The 15 larger firms registered a combined increase in earnings of 22% to $644 million, but a 1% decrease in sales to a total of $14.4 billion. Profit margins for the 15 larger firms rose to an average 4.5% from 3.6% in last year's third quarter.

The third quarter has done a lot to help out the industry's performance so far this year, showing a better average year-to-year gain than either of the other two quarters. Combined earnings for the same 30 firms in the second quarter were up 12% on a year-to-year basis, following a 9% rise in the first quarter.

For the first nine months this year, sales for the 30 companies increased an average of 3% to a total of $52.2 billion. Earnings for the same companies climbed an average 15% to a total of $2.66 billion. Profit margins rose to an average 5.1% from 4.5% in the same period last year.

For the first nine months, the larger firms had better earnings growth than the smaller ones. Earnings for the 15 larger firms increased an average of 20% to about $2.30 billion on a 2% sales rise to $44.7 billion. Meanwhile, earnings at the smaller companies declined 8%, primarily on the results of fertilizer companies, to $360 million. Sales at these firms, however, rose a faster 5% to $7.55 billion.

Profit margins for the larger firms rose to an average of 5.1% from 4.4% in the first nine months of 1985. Profit margins for the smaller chemical companies declined to an average of 4.8% from 5.5% in the comparable period last year.

For the 12 months ending with the third quarter, profitability for the 30 companies was down, falling to an average of 4.1% from 4.3%. For the larger firms, it was flat at 4.0%, but for the smaller companies, it fell to 4.6% from 5.8%. □